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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,627	11/16/2001	Mark A. Lemkin	AIMI-01924US0	3417

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EXAMINER
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TERESINSKI, JOHN

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/990,627

Applicant(s)

LEMKIN ET AL.

Examiner

John Teresinski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 23-35 and 41-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22, 36-40 and 45-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-22, 36-40 and 45-49, drawn to a capacitive sensing circuit and method of operating a switched-capacitor circuit, classified in class 324, subclass 656.
- II. Claims 23-35, drawn to a sampled data system, classified in class 324, subclass 76.58.
- III. Claims 41-44, drawn to an optical mirror switch, classified in class 324, subclass 76.36.

Claim 1 link(s) inventions I and III. The restriction requirement between the linked inventions is subject to the nonallowance of the linking claim(s), claims 1, 36 and 49. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s) is/are presented in a continuation or divisional application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

The inventions are distinct, each from the other because:

Inventions III (optical mirror switch) and I (capacitive sensing circuit) are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because all the limitations of Group I such as the detector coupled to a sense capacitor is not found in Group III, the subcombination has separate utility such as sensing capacitance which can be used in position sensing.

Inventions II (sampled data system having two phases) and I (capacitive sensing circuit) are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because all the limitations of Group I such as sense capacitor and detector are not found in Group II. The subcombination has separate utility such as sensing capacitance which can be used in position sensing.

Inventions III (optical mirror switch) and II (sampled data system having two phases) are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself

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or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because all the limitations of Group II such as the second phase sampling of a transducer is not found in Group III, the subcombination has separate utility such as sensing motion which can be used in position sensing.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

During a telephone conversation with Larry Vierra on 2/20/2003 a provisional election was made without traverse to prosecute the invention of claims 1-22, 36-40 and 45-49. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-35 and 41-44 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### *Specification*

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means"

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and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it contains the legal phraseology comprises. Correction is required. See MPEP § 608.01(b).

### *Drawings*

The drawings are objected to because Fig. 1, 2 and 3 contain unlabeled boxes, which do not specify the operation of the boxes. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 6, 14, 19, 20-22, 36-39 and 45-47 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,612,494 to Shibano.

Regarding claims 1, 45 and 46, Shibano discloses a capacitance type acceleration sensor having:

a sense pulse generator providing a first polarity sense pulse and a second polarity sense pulse (column 5 lines 1-5, Fig. 1 element 7);

a sense capacitor coupled to the sense pulse generator (column 5 lines 8-16 Fig. 1 element 1);

a detector coupled to the sense capacitor (column 5 lines 8-16 Fig. 1 element 3); and

a storage device coupled to the detector (column 5 lines 4-5, Fig. 1 element 4).

Regarding claims 2, 3 and 47, Shibano discloses a sample and hold storage circuit comprising of an amplifier and a capacitor (Fig. 1 elements 4, A2, and CH).

Regarding claim 5, Shibano discloses a filter coupled to the storage device (Fig. 1 element 8).

Regarding claim 6, Shibano discloses providing a first polarity sense over a first phase and a second polarity sense pulse over a second phase(column 6 lines 20-31).

Regarding claim 14, Shibano discloses a second sense capacitor coupled to the detector (Fig. 1 elements C1,C2).

Regarding claims 19 and 20, Shibano discloses a first and second sense pulses as voltage pulses (column 6 lines 8-10) and charge pulses (column 7 lines 5-10).

Regarding claims 21 and 22, Shibano discloses a detector comprising a charge detector and voltage detector (column 7 lines 53-67).

Regarding claims 36 and 39, Shibano discloses a sense pulse generator with an inverting polarity over two phases (column 6 lines 9-34).

Regarding claim 37, Shibano discloses a charge detector comprising a buffer (Fig. 1 element A1).

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Regarding claim 38, Shibano discloses a charge integrator (Fig. 1 element 3).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibano in view of U.S. Patent No. 6,188,294 to Ryan et al..

Regarding claim 4, Shibano does not disclose a capacitor as the storage device. Ryan et al. discloses a random sequence generator utilizing a capacitor as a storage device for a capacitive sensing circuit (column 6 lines 66-67 column 7 lines 1-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a capacitor as the storage means as taught by Ryan et al. into Shibano for the purpose of providing a storage means capable of compensating for white noise (column 7 lines 9-12).

Claims 7, 8, 10-13, 17, 18, 40, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibano in view of U.S. Patent No. 5,606,515 to Mockapetris et al..

Regarding claims 7, 8, 10, 17, 18, 48 and 49, Shibano discloses a switch having a first input coupled with a low-pass filter (Fig. 1 elements 6 and 8). Shibano does not disclose a demodulation circuit coupled to the storage device or an analog to digital converter coupled to the storage device and the demodulator. Mockapetris et al. disclose circuitry for providing



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alternating current excitation waveforms for transducers including an analog to digital converter coupled to storage means and coupled to a demodulator with an input and output (column 1 lines 41-51, Fig. 2 element 61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an analog to digital converter coupled to storage means and coupled to a demodulator as taught by Mockapetris et al. into Shibano for the purpose of providing increased processing capabilities of the measured response (column 1 lines 51-53).

Regarding claim 11, Shibano discloses a second input of the nonlinear element/switch coupled to a signal synchronous with sense pulse polarity (Fig. 1 elements 6 and 7).

Regarding claim 12, Shibano discloses an analog sensor output (column 2 lines 56-65).

Regarding claims 13 and 40, Shibano does not disclose a digital input to the demodulation circuit. Mockapetris et al. disclose a digital input to the demodulation circuit (column 1 lines 41-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the digital input means to the demodulation circuit as taught by Mockapetris et al. into Shibano for the purpose of providing simple and accurate demodulation of the digital response (column 1 lines 51-53).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibano and Mockapetris et al. as applied to claims 1, 6 and 7 above, and further in view of U.S. Patent No. 5,345,824 to Sherman et al..

Regarding claim 9, Shibano in view of Mockapetris et al. does not disclose a filter that includes a high pass characteristic. Sherman et al. disclose an accelerometer including a filter that includes a high pass characteristic (column 1 lines 35-48). It would have been obvious to

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one of ordinary skill in the art at the time the invention was made to include a filter with a high pass characteristic as taught by Sherman et al. into Shibano and Mockapetris et al. for the purpose of providing a full scale range of measurement (column 1 lines 35-48).

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibano in view of U.S. Patent No. 5,345,824 to Sherman et al..

Regarding claims 15 and 16, Shibano discloses detector output responsive to the orientation of the sensing structure (column 1 lines 60-67). Shibano does not disclose third and fourth capacitors coupled to the detector and sense pulse generator, or the sensors forming part of a microstructure. Sherman et al. disclose an accelerometer comprising four capacitive sensors forming part of a microstructure (column 5 lines 10-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include four capacitive sensors forming part of a microstructure as taught by Sherman et al. into Shibano for the purpose of providing multiple oriented sensors on a single substrate (column 8 lines 31-41).

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,748,004 to Kelly et al. disclose a capacitive sensing device that applies oppositely phased square waves to a differential capacitor.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Teresinski whose telephone number is (703) 305-4746.

The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872 9319 for regular communications and (703) 872 9318 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JT

JT

March 13, 2003

*Christine Oda*  
Christine Oda  
Primary Examiner